

Application No.: 10/712,236

Docket No.: JCLA11795

In The Claims:

Claim 1. (withdrawn) A diode structure, comprising:

a first conductive type substrate;

a second conductive type first well region located within the substrate;

a first conductive type second well region located within the first well region;

a second conductive type first doped region located within the first well region and detached from the second well region but adjacent to the surface of the substrate; and

a first conductive type second doped region and a second conductive type third doped region located within the second well region and adjacent to the surface of the substrate, wherein the second doped region is located between the first doped region and the third doped region but detached from both the first doped region and the third doped region.

Claim 2. (withdrawn) The diode structure of claim 1, wherein the first doped region and the second doped region are coupled to a drain terminal and the third doped region is coupled to a ground terminal.

Claim 3. (withdrawn) The diode structure of claim 1, wherein the diode further comprises a shallow trench isolation region set between the first doped region and the second doped region and between the second doped region and the third doped region and set adjacent to the surface of the substrate.

Claim 4. (withdrawn) The diode structure of claim 1, wherein the first conductive type is an n-doped type and the second conductive type is a p-doped type or vice versa.

Application No.: 10/712,236

Docket No.: JCLA11795

Claim 5. (withdrawn) A diode string structure, comprising:

a first conductive type substrate;

at least two diode structures located within the substrate, wherein each diode structure comprising:

a second conductive type first well region located within the substrate;

a first conductive type second well region located within the first well region;

a second conductive type first doped region located within the first well region and detached from the second well region but adjacent to the surface of the substrate; and

a first conductive type second doped region and a second conductive type third doped region located within the second well region and adjacent to the surface of the substrate, wherein the second doped region is located between the first doped region and the third doped region but detached from both the first doped region and the third doped region.

Claim 6. (withdrawn) The diode string structure of claim 5, wherein the third doped region of each diode is coupled to the first doped region and the second doped region of a following diode.

Claim 7. (withdrawn) The diode string of claim 6, wherein the first doped region and the second doped region are coupled to a drain terminal and the third doped region is coupled to the first doped region and the second doped region of the following diode if the diode is the first diode in the diode string.

Application No.: 10/712,236

Docket No.: JCLA11795

Claim 8. (withdrawn) The diode string of claim 6, wherein the third doped region is coupled to a ground terminal and the first doped region and the second doped region are coupled to the third doped region of a previous diode if the diode is the last diode in the diode string.

Claim 9. (withdrawn) The diode string of claim 5, wherein the diode string further comprises a first shallow trench isolation region set between neighboring diode structures and adjacent to the surface of the substrate.

Claim 10. (withdrawn) The diode string of claim 5, wherein the diode string further comprises a second shallow trench isolation region set between the first doped region and the second doped region and between the second doped region and the third doped region and adjacent to the surface of the substrate.

Claim 11. (withdrawn) The diode string of claim 5, wherein the first conductive type is a p-doped type and the second conductive type is an n-doped type or the first conductive type is an n-doped type and the second conductive type is a p-doped type.

Claim 12. (Currently Amended) A diode string structure having a starting end and a terminal end, comprising:

~~a first conductive type~~ substrate with a first conductive type;

~~a second conductive type~~ first well region with a second conductive type located within the substrate;

a first doped region with the second conductive type located within the first well region at ~~a starting terminal~~ the starting end of the diode string, wherein the first doped region is adjacent to the surface of the substrate and the first doped region is coupled to a drain terminal; and

Application No.: 10/712,236

Docket No.: JCLA11795

at least two diode structures located within the first well region, wherein each diode structure is detached from the first doped region and each diode ~~comprising comprises~~:

a ~~first conductive type~~ second well region with the first conductive type located within the first well region; and

a ~~first conductive type~~ second doped region with the first conductive type and a ~~second conductive type~~ third doped region with the second conductive type located within the second well region and adjacent to the surface of the substrate, wherein the first third doped region and the second doped region are detached from each other; and

~~a second conductive type first doped region located within the first well region at a starting terminal of the diode string, wherein the first doped region is detached from the second well region but adjacent to the surface of the substrate.~~

Claim 13. (Currently Amended) The diode string structure of claim 12, wherein a ~~third doped region of each diode structure is coupled to the second doped region of a following diode.~~ for each diode structure neither the first diode structure at the starting end of the diode string nor the last diode structure at the terminal end of the diode string, there is a post diode structure directly located next to the diode structure in the diode string and the third doped region of the diode structure is coupled to the second doped region of the post diode structure.

Claim 14. (Currently Amended) The diode string structure of claim 13, wherein when the diode is located at the starting end of the diode string adjacent to the first doped region, the second doped region and the first doped region are coupled to a drain terminal of the diode is coupled to the first doped region and the third doped region of the diode is coupled to the second

Application No.: 10/712,236

Docket No.: JCLA11795

doped region of ~~the following~~ another diode next to the first diode in the diode string ~~if the diode is the first diode in the diode string~~.

Claim 15. (Currently Amended) The diode string of claim 13, wherein when the diode is located at the terminal end of the diode string, the third doped region of the diode is coupled to a ground terminal and the second doped region of the diode is coupled to the third doped region of ~~a previous~~ another diode prior to the diode ~~if the diode is the last diode in the diode string~~.

Claim 16. (Original) The diode string of claim 12, wherein the diode string further comprises a first shallow trench isolation region set between neighboring diode structures and adjacent to the surface of the substrate.

Claim 17. (Original) The diode string of claim 12, wherein the diode string further comprises a second shallow trench isolation region set between the first doped region and the third doped region and between the first doped region and the second doped region and adjacent to the surface of the substrate.

Claim 18. (Original) The diode string of claim 12, wherein the first conductive type is a p-doped type and the second conductive type is an n-doped type or the first conductive type is an n-doped type and the second conductive type is a p-doped type.

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